

CONTENT STANDARD 4: Problem Solving/Research and Development

Students will recognize technology as the result of a creative act, and will be able to apply disciplined problem-solving strategies to enhance invention and innovation.

K - 12 PERFORMANCE STANDARDS

<p>Educational experiences in Grades K-4 will assure that students:</p> <ul style="list-style-type: none"> • identify and define a problem; • describe different methods of problem solving; • describe one problem-solving model; • gather, record and organize data, based on observations; • develop an action plan; • evaluate a solution to a problem; • communicate their solutions to problems with others; and • identify a problem and use a problem-solving method to develop a solution. 	<p>Educational experiences in Grades 5-8 will assure that students:</p> <ul style="list-style-type: none"> • differentiate between human problems and needs; • define decision-making, research and invention; • discuss how technological systems have been used to solve human problems; • select and apply a general problem-solving model in a laboratory setting; • identify research methods, materials and techniques; • apply cooperative techniques while engaged in group problem-solving activities; • engage in an activity that requires creativity; • apply appropriate and effective questioning techniques; • describe and apply the processes used to make decisions; <p align="right">(continued)</p>	<p>Educational experiences in Grades 9-12 will assure that students:</p> <ul style="list-style-type: none"> • use research techniques to support design development; • apply the descriptive statistics of average, percentage, correlation and graphing to design outcomes; • develop several alternative design solutions to the same problem; • use a communication technology to visualize a design idea; • know the laws related to copyrights, trademarks and patents; • present a design idea using multimedia technology; • prepare and document a design brief; • select appropriate technical processes and fabricate a prototype; • design and conduct a technical experiment; and <p align="right">(continued)</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

K-12 PERFORMANCE STANDARDS, continued

Educational experiences in **Grades 5-8** will assure that students:

- conduct an applied re-search project;
- develop, test and modify a design idea through experimentation;
- differentiate between invention and innovation; and
- develop a solution for a real-life problem.

Educational experiences in **Grades 9-12** will assure that students:

- apply biological materials and processes to solve a problem.